CZECHOSLOVAKIA UDC 615.334(PENICILLINUM).012.6.002.62

FUSKA, YA., YAKUBOVA, A., GALYAMA, D. V., and BUCHKO, M., Chair of Technical Microbiology and Biochemistry, Chemico-Technological Faculty, Slovak Technological Institute, Bratislava, and Biotika, Slovenska Lyupcha

"Production of 6-Aminopenicillanic Acid"

Moscow, Antibiotiki, Vol 17, No 9, Sep 72, pp 775-778

Abstract: The possibility of producing 6-aminopenicillanic acid (I) directly in connection with the production of penicillin was studied. A filtrate of a production culture synthesizing benzylpenicillin was extracted with butyl acetate. The butyl acetate extract was stirred with an aqueous suspension of cells of E. coli, strain ATCC 9637, at pH 7.2-7.4. As a result of enzymatic hydrolysis of benzylpenicillin, I formed. On separation of the E. coli cells by centrifuging and changing the pH to 2.0-2.2, unconverted penicillin (benzylpenicillin) and the phenylacetic acid that formed were transferred from the aqueous into the butyl acetate phase, while I remained in the aqueous phase. I crystallized from the aqueous solution after $(NH_4)_2SO_4$ had been added to it, the pH brought to 4.2-4.3, and the solution kept

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USSR

FUSKA, YA., et al., Antibiotiki, Vol 17, No 9, Sep 72, pp 775-778

at 0-5°. The yield of I in the two solvents system depended on the volume ratio of the solvents. A yield of 85% was reached at the optimum ratio after 6 hrs of conversion. I with a purity of 92-95% was obtained. The advantage of the method described is that I, which is used in the synthesis of new penicillins, is obtained directly from the production culture without isolating penicillin.

2/2

USSR UDC 547.781/.785

VOLODARSKIY, L. B., FUST, L. A., KOBRIN, V. S., Novosibirsk Institute of Organic Chemistry of the Siberian Department of the USSR Academy of Sciences

"Synthesis and Covalent Hydration of 4H-imidazole Derivatives"

Riga, Khimiya Geterotsiklicheskikh Soyedineniy, No 9, 1972, pp 1246-1251

Abstract: The acylation of 1-hydroxy-2,5,5-trimethyl-4-phenyl-3-imidazoline-3 oxide (I) and subsequent heating of the acetyl derivative leads to 2,4,4-trimethyl-5-phenyl-4H-imidazole-1 oxide (II) (L. B. Volodarskiy, et al., KhGS, 1241, 1972). Analogous products are obtained under the same conditions from other 5,5-disubstituted 3-imidazoline-3 oxides. The effect of aqueous alkalie on 4H-imidazole-1 oxides leads to cleavage of the heteroring and the formation of α-acylaminoketone oximes. Some new derivatives of the 4H-imidazole series and their N-oxides have now been synthesized including compounds not containing oxygen, mono and di-N-oxides; their properties have been studied: 2,4,4-trimethyl-5-phenyl-4H-imidazole, 4H-imidazole-3 oxide and 4H-imidazole-1,3 dioxide were synthesized from 1-hydroxy-2,5,5-trimethyl-4-phenyl-3-imidazoline and 3-imidazoline -3 oxide. The effect of hydrogen chloride on these compounds and also on 2,4,4-trimethyl-5-phenyl--4H-imidazole-1 oxide leads to water or alcohol addition products --

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USSR

VOLODARSKIY, L. B., et al., Khimiya Geterotsiklicheskikh Soyedineniy, No 9, 1972, pp 1246-1251

derivatives of 4-hydroxy-2-imidazolinium chlorides. The synthesis procedures and results are presented for the noted series of compounds, and their ultraviolet, infrared and paramagnetic resonance spectral analyses are discussed.

2/2

USSR UDC 539.89 + 548.73

FEL'DGUN, L. I., NIKITINA, T. P., SOKHOR, M. I., and FUTERGENDLER, S. I.,
All-Union Scientific Research Institute of Abrasives and Grinding, Leningrad

"Mechanism of Modification Conversion in Boron Nitride"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 45, Vyp 12, 1971, pp 3067-3070

Abstract: Cubic boron nitride was synthesized from pyrolytic hexagonal boron nitride and its structure was studied with x-ray diffraction in order to examine the phase conversion mechanism of the hexagonal boron into the cubic form. The synthesis was carried out in a high-pressure chamber loaded with powdered and pyrolytic hexagonal boron nitride. The rate of conversion of powdered hexagonal boron nitride with a three-dimensional lattice was much higher than that of pyrolytic hexagonal boron nitride. It was attributed to a high density of pyrolytic nitride which retarded the flow of the melt between the particles and the solution of hexagonal nitride particles in the melt. The product contained dark and light colored boron nitride crystals with cubic structure. The appearance of the dark-colored crystals was due either to the presence of metal impurities, or to penetration of boron into the crystal lattice of cubic boron nitride. The crystal lattice parameters of the cubic boron nitride varied from a = 3,6157 Å for colorless crystals

USSR

FEL'DGUN, L. I., et al., Zhurnal Fizicheskoy Khimii, Vol 45, Vyp 12, 1971, pp 3067-3070

to $a = 3{,}6181$ Å for dark-colored crystals. The size of the nitride crystals was from $\sim 10^{-3}$ to 10^{-2} cm. It is concluded that there was no direct conversion of the hexagonal boron nitride into a cubic structure, but the latter was crystallized from the melt due to the presence of unordered B - N complexes in it.

2/2

1/2 005 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--ABSORPTION SPECTRA OF NI PRIME2 POSITIVE AND CO PRIME2 POSITIVE IN CADMIUM TUNGSTATE -U-

AUTHOR-(03)-NOSENKO, A.YE., PASHKOVSKIY, M.V., FUTORSKIY, D.L.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(2), 297-301

DATE PUBLISHED--------70

SUBJECT AREAS--NONE

TOPIC TAGS--ABSORPTION SPECTRUM, NICKEL, COBALT, CADMIUM COMPOUND, TUNGSTEN COMPOUND, SINGLE CRYSTAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1980/1319 STEP NO--UR/0051/70/028/002/0297/0301

CIRC ACCESSION NO--AP0049481

UNCLASSIFIED

2/2 005 UNCLASSIFIED PROCESSING DATE--18SEP70
CIRC ACCESSION NO--AP0049481
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ABSORPTION SPECTRA OF CDWO SUB4 SINGLE CRYSTALS ACTIVATED BY NI PRIME2 POSITIVE AND CO PRIME2 POSITIVE IONS ARE INVESTIGATED IN THE ENERGY REGION 4000-25,000CM PRIME NEGATIVE1 AT 300 AND 90DEGREESK. THE OBTAINED EXPTL. RESULTS CORRELATED WITH THE SCHEME OF ENERGY TRANSITIONS CALCD. BY THE METHOD OF CRYSTAL FIELD THEORY FOR A HAMILTONIAN OF ORTHORHOMIC SYMMETRY.

UNCLASSIFIED

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002200820017-9"

USSR

UDC 62-503.52

ZABLOTSKIY, G. A., CHERNUKHIN, V. Sh., FUTRITSKIY, Yu. V., Institute of Semiconductors, Academy of Sciences of the USSR

"A Device for Programmed Control of Technological Parameters"

USSR Author's Certificate No 318916, filed 12 Aug 69, published 22 Dec 71 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 9, Sep 72, Abstract No 9A181 P)

Translation: Programmed control devices are known which contain a programmed input controller connected to a two-position regulating device whose second input is connected through a device for measuring the parameter to be controlled to a pickup installed at the output of the control object and connected to an actuator. A device for programmed control of technological parameters is proposed which contains a programmed input controller connected to a two-position regulating device. The second input of the regulating device is connected through a meter for the parameter to be controlled to a pickup installed at the output of the control object. The latter is connected to an actuator. To reduce the amplitude and frequency of self-oscillations and residual displacement, the device

USSR

ZABLOTSKIY, G. A. et al., USSR Author's Certificate No 318916

contains an adder at the output of the regulating device. The adder output is connected to the actuating mechanism. The controller also incorporates an amplifier connected to the meter for the parameter to be controlled, a module for determining the sign of change in the parameter which is connected to the programmed input controller, a block for setting the transfer ratio which is connected to the output of the amplifier, to the output of the module for determining the sign of the change in the parameter, and to the adder input.

2/2

1/2 024 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--SOME HEMOPOIETIC FACTORS OF THE GASTRIC JUICE IN CHRONIC DISEASES OF THE GASTRO INTESTINAL TRACT -U-

AUTHOR-(02)-FUZAYALOV, YU.M., BEKTURDIYEV, KH.

COUNTRY OF INFO--USSR

SOURCE--TERAPECTICHESKIY ARKHIV, 1970, VOL 42, NR 3, PP 33-36

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--GASTROINTESTINAL SYSTEM, DIGESTIVE DISEASE, HEMATOPOIESIS, COPPER COMPOUND, DIAGNOSTIC MEDICINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1986/0812 STEP NO--UR/0504/70/042/003/0033/0036

CIRC ACCESSION NO--AP0102774

UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0102774

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WHEN EXAMINING 155 PATIENTS WITH CHRONIC DISEASES OF THE GASTRO INTESTINAL TRACT THE AUTHORS ESTABLISHED THE EFFECT OF GASTRIC SECRETION, LOCALIZATION OF THE PATHOLOGICAL PROCESS AND THE STAGE OF THE DISEASE ON THE CONTENT OF GASTROMUCOPROTEIN AND COPPER IN THE GASTRIC JUICE OF PATIENTS. THE DATA OF INVESTIGATION MAKE IT POSSIBLE TO MAKE A CONCLUSION THAT THERE EXISTS A DIRECT DEPENDENCE BETWEEN THE CONTENT OF COPPER AND GASTROMUCOPROTEIN IN THE GASTRIC JUICE OF PATIENTS WITH CHRONIC DISEASES OF THE GASTROINTESTINAL TRACT. DETERMINATION OF GASTROMUCOPROTEIN AND COPPER IN THE GASTRIC JUICE MAY BE USED AS AN ADDITIONAL CRITERIA OF THE FUNCTIONAL DIAGNOSIS OF THE GASTRO INTERTINAL TRACT AS WELL AS FOR DIFFERENTIAL DIAGNOSIS.

UNCLASSIFIED

USSR

UDC 661.718.1 + 547.38 + 547.514

ARBUZOV, B. A., FUZHENKOVA, A. V., ZINKOVSKIY, A. F., and KOLOSKOVA, T. N., Scientific Chemical Research Institute imeni A. M. Butlerov at the Kazan' State University

"Reaction of Trialkyl Phosphites With Indanocyclone"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 10, Oct 73, pp 2129-2133

Abstract: The reaction of trialkyl phosphites with indanocyclone goes along the Arbuzov rearrangement route, forming 1:1 bipolar type addition compounds at the first stage. If the reaction is carried out in presence of acetic acid or acetic anhydride, a series of enols is formed. An intermediate product is a bipolar ion whose presence was shown by thermographic and spectral data. An analogous addition product forms in a reaction of indanocyclone with tris(dimethylamino)-phosphine.

USSR

UDC 661.718.1+547.38+547.514

ARBUZOV, B. A., Member Academy of Sciences USSR; FUZHENKOVA, A. V., ZINKOVSKIY, A. F., and SAVCHENKO, L. Ya., Scientific Research Chemical Institute imeni A. M. Butlerov at Kazan' State University imeni V. I. Ul'yanov-Lenin, Kazan'

"The Interactions of Trimethyl Phosphite and Dimethylphosphorous Acid With Phencyclone"

Moscow, Doklady Akademii Nauk SSSR, Vol 199, No 2, 1971, pp 339-341

Abstract: A thermographic study of the addition of $(MeO)_3P$ to phencyclone showed that this reaction proceeded at a higher temperature (beginning of the exo-effect at 58-62°, maximum at 85-90°) than the addition of $(MeO)_3P$ to tetracyclone. The reaction also took place with an Arbuzov rearrangement, but not by a nucleophilic attack on the oxygen of the C=O group, as in the case of tetracyclone, but by a nucleophilic attack on the carbon atom of C=O with a subsequent rearrangement into a bipolar ion I, which then rearranged into a bipolar ion II with final isomerization into the end-product dimethyl ester of 2-methoxy-1,3-diphenyl-4,5(0,0'-biphenylene)-2,4-cyclopentadienylphosphonic acid (III), or by a direct attack on the 5-C atom adjacent to C=O with the formation of II. A proof of

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USSR

ARBUZOV, B. A., et al., Doklady Akademii Nauk SSSR, Vol 199, No 2, 1971, pp 339-341

the formation of II was the conversion of II into 1,3-diphenyl-4,5-(0,0'-biphenylene)-4-cyclopentenone-phosphonic acid (IV) by the action of proton-donor reagents, i.e., acetic acid and MeOH. IV could also be obtained by the hydrolysis of III with 1:1 HCl. The addition of dimethylphosphorous to phencyclone resulted in the formation of IV.

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USSR

UDC 542.91:547.772.2:547.1'118

ARBUZOV, B. A., SOROKINA, T. D., FUZHENKOVA, A. V., VINOGRADOVA, V. S.

"Interaction of 1,2-diphenyl-4-benzalpyrazolidine-3,5-dione with Trimethylphosphite and Tri(dimethylamino)phosphine"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 11, 1973, pp 2577-2580

Abstract: A study was made of the effect of trimethylphosphite and tri(dimethylamino)phosphine on 1,2-diphenyl-4-benzalpyrazolidine-3,5-dione (I). The study was made using thermography and infrared spectroscopy.

Trimethylphosphite interacts with 1,2-diphenyl-4-benzalpyrazolidine-3,5-dione via the bipolar ion stage with the formation of the methyl ether of the enol form of the dimethyl ester of 1,2-diphenylpyrazolidine-3-5-dione-4-benzylphosphonic acid. On interaction of tri(dimenthylamino)phosphine with 1,2-diphenyl-4-benzalpyrazolidine-3,5-dione, a stable adduct (1:1) was obtained having the structure of the bipolar ion with the P-C bond.

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USSR

UDC 542.91:547.572:547.1'118

ARBUZOV, B. A., ZOROASTROVA, B. M., TUDRIY, G. A., FUZHENKOVA, A. V.

"Interaction of Dibenzal Acetone with Trimethyl Phosphite and Dimethyl Phosphorus Acid"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 11, 1973, pp 2581-2585

Abstract: A study was made of the interaction of dibenzal acetone with trialkyl phosphites. Trimethyl phosphite reacts with dibenzal acetone with the formation of 2,2,-trimethoxy-3phenyl-5 5-(β-phenyl)vinyl-1,2-oxaphospholene-4(II). When (II) is washed with water, the phosphorane ring breaks at the P-O bond with the formation of two keto phosphonates, probably S-cis- and S-transconformers. Phosphorane (II) reacts with dibenzal acetone by the diene synthesis reaction. A thermogram is presented for a mixture of dibenzal acetone with $(CH_3O)_3P$ and the reaction of dibenzal acetone with $(CH_3O)_3P$ in the presence of CH_3COOH.

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USSR

UDC 661.718.1+547.38+547.514

FUZHENKOVA, A. V., ZINKOVSKIY, A. F., SAVCHENKO, L. YA., and ARBUZOV, B. A., Chemical Scientific-Research Institute imeni A. M. Butlerov affiliated with the Kazan State University imeni V. I. Ul'yanov-Lenin

"Reaction of Fencyclone With Trialkyl Phosphite in the Presence of Acetic Anhydride"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), Vyp 4, 1972, pp 754-756

Abstract: The title reaction may go via two pathways (R = CH_3 and C_2H_5):

USSR

UDC 661.718.1 + 547.36 + 547.514

FUZHENKOVA, A. V., ZINKOVSKIY, A. F. and ARBUZOV, B. A. (Member of the USSR Academy of Sciences); Scientific-Research Chemical Institute imeni A. M. Butlerov, at the Kazan' State University imeni V. I. Ul'yanov-Lenin

"Interaction of Dimethylphosphorous Acid with Tetracyclone"

Moscow, Doklady Akademii Nauk SSSR, Vol 201, No 3, 71, pp 632-635

Abstract: The interaction between dimethylphosphorous acid and tetracyclone was studied under conditions of careful temperature control. As verified by infrared and chemical analysis, two of the end-products were the dimethyl esters of 2,3,4,5-tetraphenylcyclopentene-2-one-phosphonic-4 and ....-2 acids. With use of the catalysts triethylamine or sodium methylate, at room temperature, the dimethyl ester of 1-oxy-2,3,4,5-tetraphenylcyclopenta-2,4-dienyl-1-phosphonic acid was formed, following which, in the course of 2-3 days, O,O-dimethyl-2,3,4,5-tetraphenylcyclopente-diphenylphosphate appeared, from which 2,3-dihydrotetracyclone was finally extracted.

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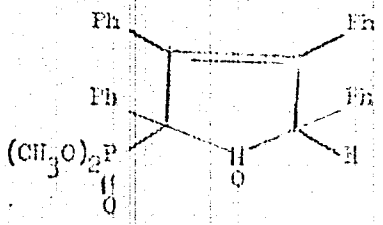
FUZHENKOVA, A. V., et al., Doklady Akademii Nauk SSSR, Vol 201, No 3, 71, pp 632-635

The presence of a compound of structure



formed with the first two compounds mentioned was suspected, but this could not be verified even chromatographically.

Physico-chemical data for all verified products of the reaction are given.

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USSR

UDC 547.514.47+547.462.3

FUZHENKOVA, A. V., ZINKOVSKIY, A. F., and ARBUZOV, B. A., Scientific Research Institute of Chemistry imeni A. M. Butlerov affiliated with Kazan' State University imeni V. I. Ul'yanov-Lenin

"Thermographic Study of the Reaction Between Trialkyl Phosphites and Tetracyclone"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 491-495

Abstract: The reaction of trialkyl phosphites with tetracyclone was studied by using thermography. Thermographic interactions of trimethyl, triethyl and tripropyl phosphites with tetracyclone showed only an exo-effect on the thermograms regardless of the heating rate up to 130°C. The reaction goes to completion at room temperature within 1-2 days. The interaction of trimethyl phosphite with tetracyclone was studied in detail. The final products isolated from the reaction mixture were 0,0'-dimethyl 5-methyl-2,3,4,5-tetraphenylcyclopenta-1,3-dienyl phosphate and crystalline 0,0'-dimethyl-3-methyl--2,3,4,5-tetraphenylcyclopenta-1,4-dienylphosphate. Reaction of trimethyl phosphite with tetracyclone in the presence of acetic anhydride yielded 0,0'-dimethyl-2,3,4,5-tetrphenylcyclopenta-1,4-dienyl phosphate instead of the expected acetyl derivative, and reaction of diethyl acetyl phosphite

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USSR -

FUZHENKOVA, A. V., et al., Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 491-495

with tetracyclone produced 0,0'-diethyl 2,3,4,5-tetraphenylcyclopenta-1,4--dienylphosphate instead of 0,0'-diethyl s-3,4,5-tetraphenyl-3-acetylcyclopenta-1,4-dienyl phosphate and 0,0'-diethyl 2,3,4,5-tetraphenyl-5-acetylcyclopenta-1,3-dienyl phosphate. Attempts to study the reaction of tetracyclone with ethyl diacetyl phosphite were unsuccessful. Thermography of mixtures of tetracyclone with trimethyl, triethyl and diethyl acetyl phosphites reveals another exo-effect at higher temperatures as a result of thermal conversion of phosphorus-containing products synthesized by passage through the first exo-effect. A Kurnakov PK-52 pyrometer with chromel-alumel thermocouple in sealed Stepanov vessels was used for the thermographic analysis. Calcined magnesium oxide was the standard. The exo-effect accompanying the reaction of trialkyl phosphites with tetracyclone is attributed to a two-step reaction involving an Arbuzov rearrangement and nucleophilic attack of the phosphorus atom either on the oxygen atom of the carbonyl group to form a bipolar form of the phosphate type, or on the carbon with phosphonate-phosphate rearrangement of the resultant bipolar ion.

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USSR

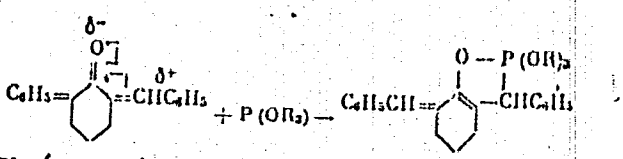
UDC 661.718.1

ARBUZOV, B. A., Academician, ZOROASTROVA, V. M., TUDRIN, G. A., and FUZHENKOVA, A. V., Chemical Institute imeni A. M. Butlerov, Kazan' State University imeni V. I. Ul'yanov-Lenin

"Reaction of 2,6-Dibenzylidenecyclohexanone With Trialkyl Phosphites"

Moscow, Doklady Akademiii Nauk SSSR, Vol 200, No 4, 1971, pp 847-849

Abstract: Trialkyl phosphites react with 2,6-dibenzylidenecyclohexanone during heating in a sealed ampoule (100°, 4-10 hours) to give 1:1 adducts of phosphorane structure (Ia) and (Ib):



Ia ($R=CH_3$), Ib ($R=C_2H_5$). The structure of the resultant phosphoranes was confirmed by IR and NMR spectra and study of their chemical properties. Phosphorane (Ia) is hydrolyzed in benzene with an equimolar quantity of water to give the dimethyl ester of 2-(6-benzylidenecyclohexanone)-benzylphos-

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USSR

ARBUZOV, B. A., Doklady Akademii Nauk SSSR, Vol 200, No 4, 1971, pp 847-849

phonic acid. Phosphorane (Ib) is readily saponified in an ether solution with atmospheric moisture.

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USSR

RABINOVICH, G. V., FYODOROV, G. V.

UDC 621.373.43

"An Oscillator Which Generates Pulse Series with Controllable Intervals Between Pulses"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 8, 10 Feb 70, p 36, Patent No 263661, Filed 26 Sep 69

Translation: This Author's Certificate introduces an oscillator which generates pulse series with controllable intervals between pulses. The unit contains a self-oscillating multivibrator which sets the repetition frequency for the pulse series, a kipp oscillator which determines the duration of the pulse series and is connected to an AND circuit, and an accumulator. The oscillator differs because to control the duration of intervals within a series, a blocking circuit is connected in parallel with the accumulator to the output of the AND gate. The blocking input of this circuit is connected to the output of a slave multivibrator triggered by an output signal from the accumulator.

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AP9053062

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UR 0289

PRIMARY SOURCE: Izvestiya Sibirskogo Otdeleniya, AN SSSR, Seriya Khimicheskikh Nauk, Nr 12(162), Nr 5, pp 47-52

N. Ya. Fyodorov, E. S. Petrov

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19

THE PHASE DIAGRAMS OF THE $ScBr_3$—NaBr and $ScBr_3$—KBr SYSTEMS

The phase diagrams of binary systems formed by scandium bromide with sodium bromide and potassium bromide have been studied by differential thermal and X-Ray phase analysis. Compound Na_3ScBr_6 with peritectic point at 515°, compound K_3ScBr_6 congruently melting at 697° and incongruently melting compound $K_3Sc_2Br_9$ with peritectic point at 525° are formed in thes systems. The compound K_3ScBr_6 enters polymorphic rearrangement at 440°.

1949 1818

18

AP9053076

UR 0289

PRIMARY SOURCE: Izvestiya Sibirskogo Otdeleniya, AN SSSR, Seriya Khimicheskikh Nauk, Nr 12(162), Nr 5, pp 62-65

16 5 1 22

A. A. Opalovsky, V. E. Fyodorov, B. G. Erenburg, E. U. Lobkov, L. N. Senchenko

NEW X-RAY DATA ON TUNGSTEN AND RHENIUM SELENIDES

Complete tables of interplanar disfances for WSe_2 and $ReSe_2$ have been determined; the WSe_2 lattice constants have been corrected.
$ReSe_2$ prepared from elements is a new structure modification.

czw

1/1 1949 1832 18

USSR UDC 537.533.2+537.534

ANDREYEVA, M. I., BORISOV, V. L., FYUKOV, V. K.

"Thermoelectron Emission of Certain Metals in Cesium Vapors"

Tr. Leningr. politekhn. in-ta (Works of Leningrad Polytechnical Institute), 1970, No 311, pp 3-9 (from RZh-Fizika, No 12(I), Dec 70, Abstract No 12Zh627)

Translation: The results of a study of thermoelectron emission of Mo, W, Re, and W-Re alloy (VR-15) in Cs vapors are presented. A distinct feature of the work is the relatively high values of the Cs pressure reaching, in the limiting case, 0.16 mmHg. The change in the work function of the Me-Cs system as determined by the total current method was traced over a broad range of emitter temperatures and Cs vapor pressures. It was shown that the smallest value of the work function, corresponding to an optimum coating of Cs and determined both by the total current method and by the Richardson line method, is observed in the case of Re and the W-Re alloy. The lowest values of the heat of vaporization of cesium atoms was obtained for these objects. 10 references. Authors abstract.

1/1

USSR UDC 621.385.032.26.001.5

GAAL', L.N., KEL'MAN, V.M., KNYAZ'KOV, L.G., SHERSHEVSKIY, A.M. [Spets. konstrukt. byuro analit. priborostr. AN SSSR--Special Design Bureau For Analytical Instrument Manufacture, AS, USSR]

"Electron-Optical Prism"

USSR Author's Certificate No 263057, filed 14 Nov 66, published 28 May 70 (from RZh--Elektronika i yeye primeneniye, No 1, January 1971, Abstract No 1A15P)

Translation: An electron-optical prism is proposed which contains a magnet with a uniform field and parallel boundaries. With the object of increasing the angular dispersion without distrubance of the telescopicity of the prism, cylindrical electron lenses are mounted on the two sides of the magnet, the focuses of which match the focuses of the lenses which are formed by the boundary fringing fields of the magnet. For a decrease of the size and weight of the magnet, the focal length of the electron lenses is larger than the focal lengths of the lenses which are formed by the boundary fringing fields of the magnet. The electron-optical prism can be used as a dispersing element during determination of the energies of electrons, protons, positrons, measurement of ion masses, and also during separation of isotopes.

1/1

USSR UDC: 8.74

GAAZE-RAPOPORT, M. G., LUKIANOVA, S. N.

"On a Graph Analysis Program"

V sb. Tsifr. vychisl. tekhnika i programmir. (Digital Computer Technology and Programming--collection of works), vyp. 7, Moscow, "Sov. radio", 1972, pp 107-120 (from RZh-Kibernetika, No 8, Aug 72, Abstract No 8V657)

Translation: The paper describes a digital computer program for solving the problem of representing a graph in stacked parallel form with isolation of the "residue" of the graph which contains cycles. Authors' abstract.

1/1

GAAZE-Rappoport M.G.

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FROM: FBIS. Foreign Press Digest, Cybernetics in the USSR, 28 Jan 70, FPD 0006

54. USSR

TITOV, V. A., Compiler

Biologiya i Tekhnika (Biology and Technology); Moscow, "Znaniye" Publishing House, 1969, pp 1-3

Translation: Table of Contents

1/3

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AT0033277

FOREWORD

Advances in modern science, improvements in new technical devices and methods of scientific research, and the inception of new inter-disciplinary sciences, such as cybernetics, that explore subjects of different classes from unified vantage points and with unified methods (technical, biological, and social subjects), all this has led to a very decided narrowing of the gap between technical systems and biological materials.

Today few are any longer surprised by the fact that similar pathways are often independently chosen for the resolution of the same kinds of problems in nature and technology, nor the fact that technical systems and biological mechanisms sometimes exhibit surprisingly profound theoretical and structural similarities.

These facts have been the springboard for a new scientific pursuit -- bionics,

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which aims at purposefully studying and using for the interests of technology the properties and characteristics of living systems. Quite a large number of popular books have been written on bionics and much serious research has been devoted to it.

Examining all the extremely wide-ranging aspects and directions in bionics research would take too much space and time. Therefore, in this book we will look at only a number of fragments of bionics research in directions which have thus far remained relatively little studied and which are still of very great scientific and practical interest both for the development of purely bionic investigations conducted in the interests of technology, as well as for progress in relatively under-explored realms of biology and related disciplines. The compilation covers several of the newest aspects of modern bionics studies and, as the editor hopes, may promote the reader's fascination for the new and promising scientific discipline that bionics represents.

3/3

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USSR UDC 624.07:534.1

GABADADZE, D. T.

"Determining the Errors in Natural Transverse Frequencies of Cylindrical Springs"

V sb. Mekh. mashin (Machine Mechanics -- Collection of Works), Tbilisi, "Metsniyereba", 1972, pp 95-102 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V281)

Translation: Errors in the natural transverse frequencies of cylindrical springs caused by initial (technological) tolerances in the parameters are determined. Formulas are given for the relative errors (partial, total, and mean-square) corresponding to a spring with rigidly fastened ends. Numerical calculations are made on the basis of these formulas for different values of diameter of the wire, the index of the spring, the relative free height, and the number of coils. A certain portion of these calculations are presented in tables. The necessity of taking into account tolerances in calculating transverse frequencies of springs is pointed out. M. V. Khvingiya.

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USSR

UDC: 537.312.62

BOTOSHAN, N. I., GABARADZHIU, V. E., and MASKALENKO, V. A.

"Investigating the Densities of the States of a Two-Zone Superconductor With a Nonmagnetic Impurity"

Kishinev, V sb. Issled. po kvant. teorii sistem mnogikh chastits (Investigating Systems of Many Particles by the Quantum Theory) 1971, pp 18-26 (from RZh--Radiotekhnika, No 4, 1972, Abstract No 4D485)

Translation: Calculations are made of the densities of the electronic states of a two-zone superconductor with a nonmagnetic impurity in the entire frequency interval in the two limiting case of small and large impurity concentrations. The frequency Ω_n, at which the densities of the electronic states of the zone electrons have a maximum, as well as the values of these maxima, is determined. Two illustrations, bibliography of five. Resume

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1/2 026 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--MOLECULAR ORIENTATION IN AMORPHOUS POLYSTYRENE STUDIED BY MEANS OF BIREFRINGENCE AND INFRARED SPECTROSCOPY -U-
AUTHOR-(03)-MILAGIN, M.F., GABARAYEVA, A.D., SHISHKIN, N.I.

COUNTRY OF INFO--USSR

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CIRC ACCESSION NO--AP0116653

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ORIENTATION FACTOR (F) OF AMORPHOUS POLYSTYRENE (I) (MOL. WT. 2 TIMES 10 PRIME5 AND 7 TIMES 10 PRIME5) WAS EVALUATED BY BIREFRINGENCE (DELTA N) AND IR DICHROISM. A PLOT OF DELTA N VS. F SUBMAX. GAVE DELTA N EQUALS MINUS 0.66 F, WHICH, WHEN COMPARED WITH STEIN'S THEORY (R. S. STEIN, 1961), SUGGESTED THAT ANGLE BETWEEN A NORMAL TO THE BENZENE PLANE AND THE AXIS OF THE POLYMER SEGMENT WAS CONST. EQUAL TO 34DEGREES, REGARDLESS OF THE DEGREE OF ORIENTATION OR THE LENGTH OF THE ORIENTED CHAINS IN I. THE EVIDENCE ALSO SUGGESTED THAT ALPHA SUB1-ALPHA SUB2 (I.E., THE DIFFERENCE BETWEEN LONGITUDINAL AND TRANSVERSE POLARIZABILITY OF A STATISTICAL SEGMENT) WAS ALSO A CONST. AT ANY DEGREE OF DRAWING. FACILITY: FIZ. TECH. INST. IM. IOFFE, LENINGRAD, USSR.

UNCLASSIFIED

USSR

GABASHVILI, N. V., KIRIYA, T. A., CHACHASHVILI, A. G., CHKHAIDZE, L. L.

"Use of Methods of Mathematical Programming for Optimization of Drilling Modes"

Primeneniye Metodov Matematicheskogo Programmirovaniya dlya Optimizatsii Rezhimov Bureniya [English Version Above], Tbilisi, Metsniyereba Press, 1971, 96 pages, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V480 K).

NO ABSTRACT.

USSR UDC 62..233.4

GABASHVILI, N. V., corresponding member of the Georgian Academy of Sciences, GULIZADE, M. P., corresponding member of the Georgian Academy of Sciences, KARTVELISHVILI, O. M., and KHALIMBEKOV, B. M.

"One Problem in the Optimization of the Process of Drilling Slanted Holes"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 61, No 1, 1971, pp 33-36

Abstract: A system of differential equations describing the process of drilling slanted holes with a turbine drill is derived in this article. These equations allow one to obtain the optimal parameters of the drilling operation and of the contour of the hole. The drilling parameters taken into consideration are: axial load on the bit of the turbine drill, number of revolutions of the drill, and the type of deflecting equipment needed to obtain the correct slope of the shaft. Minimum drilling time was selected as the overall criterion of optimality.

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USSR

UDC 62-504.1

GABASHVILI, N.V. (Corresponding Member Georgian Academy of Sciences) and TSIRAMUA, G.S., Tbilisi Institute of Instrumentation and Automization Media

"A Criterion for Evaluating Adaptive Discrete Systems"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 60, No 3, Dec 70, pp 553-556

Abstract: The classical Neumann-Shannon model based on a logical probability approach applied to the evaluation of faultless operations of cybernetic systems is not always convenient, due to the complexity of computations and insufficient clarity of the results. This is particularly bothersome in evaluating the operations of adapted discrete systems assembled from polyfunctional units. To avoid this problem a criterion of absolute flexibility has been introduced in the form of a coefficient of flexibility of the system, representing a ratio of the operational states of the system N_{op} to all possible states N_o. This simplifies the computations and leads to unambiguous results.

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GABASOV, R.

Cybernetics

D-2

JPRS 55013
25 Jan 1972

NEW BOOKS OF NAUKA PUBLISHING HOUSE

[List of books; Moscow, Vestnik Akademii Nauk SSSR, Russian, No 11, November 1971, pp 131-134]

Mathematical, Physical and Engineering Sciences

Avotina, M. P., and Zolotavin, A. V.: Izobarnyye yadra s massovym chislom A=147 (Isobaric Nuclei with Mass Number A=147), Department of Nuclear Physics, Leningrad, 1971, 150 pages, 1200 copies, 1 r 30 k.

Avtomatizatsiya issledovaniy dinamicheskikh protsessov elektromekhanicheskikh i pnevmaticheskikh ustroystv (Automation of Investigation of Dynamic Processes of Electromechanical and Pneumatic Devices), Institute of Machine Science, Moscow, 1971, 144 pages, illustrated, 2500 copies, 52 k.

Gabasov, R., and Kirillova, F.: Kachestvennaya teoriya optimal'nykh protsessov; teoreticheskiye osnovy kibernetiki (Qualitative Theory of Optimal Processes; Theoretical Principles of Cybernetics), Moscow, 1971, 508 pages, 6000 copies, 2 r.

Gel'fand, I. M.; Glagoleva, Ye. G.; Shnol', E. E.: Funktsii i grafiki; osnovnyye priyemy (Functions and Graphs; Basic Techniques), Moscow, 1971, 96 pages, 200,000 copies, 13 k.

Grebenkov, Ye. A., and Ryabov, Yu. A.: Novyye kachestvennyye metody nebesnoy mekhaniki (New Qualitative Methods in Celestial Mechanics), Moscow, 1971, 442 pages, 2700 copies, 2 r 02 k.

Grigoryan, A. T.: Mekhanika ot antichnosti do nashikh dney (Mechanics from Ancient Times to the Present Day), Moscow, 1971, 312 pages, illustrations, 15,000 copies, 1 r 34 k.

Zakharin, A. G.; Brailov, V. P.; Denisov, V. I.: Metody ekonomicheskogo sravneniya variantov v energetike po printsipu minimuma privedennykh zatrat (Methods of Economic Comparison of Variants in Power Engineering on the Principle of Minimum Outlays), Power Engineering Institute imeni G. M. Krzhizhanovskiy, Moscow, 1971, 174 pages, 1500 copies, 64 k.

JPRS 55013 25 Jan 72

Vestnik of the USSR Academy of Sciences
Vol. 41, No 11, 1971

GABASOV, R.

MATHematics

JPRS [illegible]

6 June 1972

SO: JPRS [illegible]

06 June 1972

CONTROLLABILITY OF LINEAR STABLE SYSTEMS

[Article by R. Gabasov, F. M. Kirillova and V. V. Krakhotko, Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences; Moscow, Doklady Akademii Nauk SSSR, Russian, Vol 203, No 3, 1972, submitted 3 June 1971, pp 537-539]

1. Let us study the control system

$$D_n(p)x(t) = Bx(t-h_1) + Cx(t-h_2) + \int_0^{h_3} H(s)x(t-s)ds + K_\beta(p)u(t). \qquad (1)$$

X is an n vector, u is an r vector, h_1, h_2, h_3 are positive numbers, $p = d/dt$, $D_n(p) = p^n + A_1p^{n-1} + \ldots + A_{n-1}p + A_n$, $K_\beta(p) = K_0p^\beta + K_1p^{\beta-1} + \ldots + K_{\beta-1}p + K_\beta$, $\beta < n$, $A_1, A_2, \ldots, A_n, B, C$ are constant n × n matrices, $k_0, k_1, \ldots, k_\beta$ are constant n × r matrices,

$$H(s) = \sum_{i=1}^{l}\sum_{j=0}^{m_i} R_{ij}\frac{s^j}{j!}\exp(a_is).$$

R_{ij} are constant n × n matrices, a_i, i = 1,...,l are constant numbers.

Let us fix the initial conditions

$$x_0(\cdot) = \begin{cases} x(\theta) = \varphi(\theta), & -\max\{h_i, i = 1, 2, 3\} = -h \le \theta < 0, \\ x^{(i)}(0) = x_0^i, & i = 0, 1, \ldots, n-1, \end{cases} \qquad (2)$$

where $\varphi(\theta)$ is a function continuous with $\dot\varphi(\theta)$. Each control u(t), t ≥ 0 from class $C^{(\beta)}$ corresponds to a unique continuous solution x(t), t ≥ 0, of the equation (1), satisfying conditions (2).

[I - USSR - C]

USSR UDC 62-50

GABASOV, R., and KIRILLOVA, F. M., Moscow

"The Method of Dynamic Programming in the Theory of Optimum Singular Controls"

Moscow, Avtomatika i Telemekhanika, No 8, 1970, pp 5-10

Abstract: In the optimization problem

$$\dot{x} = f(x, u, t), \quad x(t_0) = x_0, \quad t \in T = [t_0, t_1],$$
$$u(t) \in U, \quad J(u) = \varphi(x(t_1)) \to \min_u, \tag{1}$$
$$x = \{x_1, \ldots, x_n\}, \quad u = \{u_1, \ldots, u_r\}$$

The Bellman equation takes the form

$$-\frac{\partial S(x,t)}{\partial t} = \min_{u \in U} \frac{\partial S'(x,t)}{\partial x} f(x,u,t), \quad S(x,t_1) = \varphi(x). \tag{2}$$

Assuming that S(x,t) is a piecewise-smooth solution of equation (2), the optimum control $u^0(x,t)$ is found from the condition

$$\frac{\partial S'(x,t)}{\partial x} f(x, u^0(x,t), t) = \min_{u \in U} \frac{\partial S'(x,t)}{\partial x} f(x,u,t). \tag{3}$$

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USSR

GABASOV, R., and KIRILLOVA, F. M., Avtomatika i Telemekhanika, No 8, 1970, pp 5-10

The authors extend the method of dynamic programming to cases in which the right member of (3) is independent of control on some set Ω of elements (x,t). These cases are called "singular" controls. Differential equations are derived for the optimum process in a singular case, and these equations are then used to formulate sufficient conditions of optimality. Some fundamental points are studied, but no attempt is made to investigate the problem in its most general form. Two examples are given.

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USSR UDC 517.934

GABASOV, R. and GUSAKOVA, M. L., Belorussian State University imeni V. I. Lenin

"Principle of the Maximum for Common Discrete Systems"

Minsk, Differentsial'nyye Uravneniya, Vol 7, No 9, Sep 71, pp 1581-1590

Abstract: The authors prove the necessary conditions of optimality for objects described by nonlinear difference equations that are not resolved relative to the leading difference. They study separately the nondegenerate and the degenerate cases. Since the necessary conditions for 1st-order optimality have been studied sufficiently, in this article the authors investigate the possibility of expanding the principle of the maximum to common discrete systems. In so doing, they first formulate the problem and give a formula for the increase in the functional of quality. They then cite the necessary conditions of optimality for nondegenerate systems, divided into a description of the local principle of the maximum and the differential principle of the maximum. Theorems are used to discuss the problem, and the first three sections of the article are generalized through examples. The authors finally discuss the principle of the maximum for degenerate systems, divided into degenerate linear systems and degenerate nonlinear systems. They also

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USSR

GABASOV, R. and GUSAKOVA, M. L., Differentsial'nyye Uraneniya, Vol 7, No 9, Sep 71, pp 1581-1590

use theorems for proof of their arguments. The article contains 5 bibliographic entries.

USSR UDC: 51:621.391

GABBASOV, N. Z.

"On the Characteristics of Events Represented by Finite Probabilistic Automata"

Uch. zap. Kazan. un-t (Scientific Notes of Kazan University), 1970, 130, No 3, pp 18-27 (from RZh-Kibernetika, No 1, Jan 71, Abstract No 1V359)

Translation: The author investigates some properties of events which are representable in probabilistic automata. It is shown that for a quasi-definite automaton with an isolated point of the cross section, the minimum length l of a word which is representable in this automaton (not counting the empty word) is no greater than

$$\max\left[1, r\left(1+\ln\frac{2\delta}{\delta}\Big/\ln\Delta\right)\right],$$

where r is the minimum whole number at which for all words p of length r a matrix made up of any two lines of matrix $A(p)$ (the matrix for changes of the probabilistic automaton under the effect of word p) contains a positive column, $\Delta=\frac{1}{2}\max_{i,j,|p|=r}\sum_{k=1}^{n}|\sigma_{ik}(p)-\sigma_{jk}(p)|<1$, ($\sigma_{ik}(p)$ is an element of matrix $A(p)$, n is

GABBASOV, N. Z., Uch. zap. Kazan. un-t, 1970, 130, No 3, pp 18-27

the number of states of the probabilistic automaton), $\varepsilon = \frac{1}{2}\max_{x\in X}\sum_{k=1}^{n}|\mu_k(x)-\mu_k|$ (X is the set of input signals, μ_k is the k-th component of the initial distribution $\bar{\mu}$, and $\mu_k(x)$ is the k-th component of the vector $\bar{\mu}A(x)$), δ is the maximum positive number which satisfies the condition $\inf_{p\in F_X\setminus l}|X(p)-\lambda| > \delta$ ($X(p)$ is the probability that there will be F states in the given set when the input word p is transmitted, and F_X is a free semigroup generated by X. An example of a probabilistic automaton is given for which the resultant estimate is only 1 greater than exact values of l. It is also established that an event which consists of all words for which the probabilistic automaton is in set F with probability one is representable by a deterministic automaton with a number of states not exceeding $2^n - 1$, and an effective algorithm is given for constructing this automaton. It is asserted that for any regular event U with H classes of equivalence with respect to U, and for any λ, $0 \leq \lambda < 1$ ($0 < \lambda \leq 1$), a nondenumerable class of probabilistic automata can be found with $3H$ states, each of which represents U by intersection point λ (for each of them the event U is the set of words p for which $X(p) = \lambda$). In conclusion, it is pointed out that the problem of determining the quasidefiniteness of a probabilistic automaton reduces to the problem of determining the emptiness of some effectively predetermined set of natural numbers. G. Agasandyan.

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USSR

Analysis and Testing

GONCHAROVA, V. V., LYAPICHEV, I. G., GABCHAK, A. G.

"Technology of Chemical-Heat Treatment and Structural Testing of YuNDK35T5 Magnetic Alloy"

Moscow, Isvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 8, 1972, pp 136-139.

Abstract: Results are presented from experimental study of the influence of the composition of a borocementing medium on the properties and depth of the surface saturated layer of YuNDK35T5 alloy. Metallographic and x-ray structural analysis of the surface saturated layer are performed. Stabilization of the gamma-phase following chemical and heat treatment help to improve the workability of this alloy. The depth of the layer increases when the alloy is saturated in the two-phase state and its bonding with the main volume is improved following high-temperature thermomagnetic treatment. Testing by the method of measurement of the thermo emf in comparison with measurement of microhardness provides greater productivity and stability of results.

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USSR

UDC: 612.23

GABDRAKHMANOV, R. Sh., Group of the Academy of Medical Sciences, USSR (Headed by M. V. Sergiyevskiy), Kuybyshev

"Role of the Medulla Oblongata Medial Zone in the Rhythmic Activity of Respiratory Center Neurons"

Leningrad, Fiziologicheskiy zhurnal SSSR im. I. M. Sechenova, No 10, vol 58, 1972, pp 1514-1519

Abstract: Stating that the function of the medial zone of the medulla oblongata in the total complex of the respiratory center has not been sufficiently studied, the author describes experiments he performed to clarify that function. He used the method of deadening the neurons of the medial and lateral zones of the center with cocaine and dihydroergotoxin, which were chosen because they halt the automatic activity of the respiratory center by blocking the adrenoreactive system of the medulla oblongata. The experiments were performed on 35 cats under nembutal anesthesia, and the method of the experiment as well as the proportions of the cocaine and dihydroergotoxin solutions are given. It was concluded that the medial zone participates in forming the rhythm of the respiratory center lateral neurons through the adrenoreactive

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USSR

UDC: 612.28

GABDRAKHMANOV, R. Sh., Fiziologicheskiy zhurnal SSSR im. I. M. Sechenova, No 10, vol 58, 1972, pp 1514-1519

structures, and that the adrenoreactive systems activating the afferent pulses are better developed in the medial zone of the respiratory center than in the lateral zone.

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USSR

KUTUZOV, B. N., KRYUKOV, G. M., GABDRAKHMANOV, S. B.

"Methods and Results of Experimental Studies of Mechanical Properties of Rock at High Deformation Rates"

Termomekh. Metody Razrusheniya Gorn. Porod. Ch. 1. [Thermomechanical Methods of Rock Destruction, Part 1 -- Collection of Works], Kiev, Nauk. Dumka Press, 1972, pp 28-33, (Translated from Referativnyy Zhurnal, Mekhanika, No 10, 1972, Abstract No 10 V729, by Ye. I. Shemyakin).

Translation: Cylindrical specimens 30-42 mm in diameter and two to four diameters high were studied on an installation for monaxial dynamic deformation of rock at deformation rates $\dot{\varepsilon}$ of up to 500 sec^{-1}. The experiments showed that the modulus of elasticity is independent of deformation rate and corresponds to the dynamic modulus determined by the ultrasonic method in the range of change of $\dot{\varepsilon}$ from 30 to 500 sec^{-1}. It was established that, in contrast to the modulus of elasticity, the strength characteristics of rock depend significantly on the deformation rate. With $\dot{\varepsilon}$ = 500-600 sec^{-1}, the strengths of the rocks studied in monaxial compression increased by 5-7 times over their static values, reaching approximately 0.01 E_2; the rise rate of strength decreases with increasing deformation rate. 6 Biblio. Refs.
1/1

USSR

UDC: 547.241+547.653

KAMAY, G. Kh., KHASANOV, A. S., AZERBAYEV, I. N., GABDULLINA, N. Z.
Institute of Chemical Sciences, Academy of Sciences of the Kazakh SSR

"Products of the Reaction of Chloral With Dialkyl Naphthyl Phosphites"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 6, Jun 72, pp 1300-1302

Abstract: Continuing their work on the synthesis of dialkyl naphthyl phosphites, the authors studied the reaction of dialkyl α-naphthyl and dialkyl β-naphthyl phosphites with chloral and studied the physiological activity of the resultant compounds. Chloral was added slowly to an ether solution of the phosphite. The reactions yielded alkyl naphthyl β,β'-dichlorovinyl phosphates and the corresponding alkyl chlorides

$$C_{10}H_7OP(OR)_2 + Cl_3CCHO \longrightarrow C_{10}H_7OP(O)(OR)OCH{=}CCl_2 + RCl$$

The resultant products are colorless liquids which gradually hydrolyze in air. All the compounds are excellent insecticides with comparatively low toxicity for warm-blooded animals. Because of their low toxic properties and their curative effect in treatment of hypodermatosis of cattle, alkyl naphthyl β, β'-dichlorovinyl phosphates show promise for use in veterinary practice.

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USSR UDC 517.948

GABDULKHAYEV, B. G., Kazan'

"Direct Methods for the Solution of Some Operator Equations, III"

Kazan', Izvestiya Vysshikh Uchebnykh Zavedeniy -- Matematika, No 4, Apr 72, pp 32-43

Abstract: The article considers a singular integrodifferential equation of the form

$$\sum_{k=0}^{m}\left[a_k(s)x^{(k)}(s)+\frac{h_k(s)}{2\pi}\int_0^{2\pi}\operatorname{ctg}\frac{\sigma-s}{2}\,x^{(k)}(\sigma)\,d\sigma+\right.$$

$$\left.+\frac{1}{2\pi}\int_0^{2\pi}h_k(s,\sigma)\,x^{(k)}(\sigma)\,d\sigma\right]=f(s), \qquad (5.1)$$

$$x^{(k)}(0)=x^{(k)}(2\pi),\quad k=\overline{0,\ m-1}, \qquad (5.2)$$

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GABDULKHAYEV, B. G., Izvestiya Vysshikh Uchebnykh Zavedeniy -- Matematika, No 4, Apr 72, pp 32-43

where a_k, b_k, $h_k (k = \overline{0, m})$, and f are bounded, 2π-periodic functions and the singular integrals are understood in the sense of the Cauchy-Lebesgue principal value. An approximate solution of this problem is sought in the form of the trigonometric interpolation polynomial

$$x_n(s) = \frac{2}{N} \sum_{k=1}^{N} c_k \Delta_n(s - s_k) \equiv \alpha_0 + \sum_{r=1}^{n} \alpha_r \cos rs + \beta_r \sin rs, \quad n = \left[\frac{N}{2}\right], \qquad (5.3)$$

where $\Delta_n(s)$ is an ordinary or modified Dirichlet kernel, depending on the evenness or oddness of the number N of nodes

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GABDULKHAYEV, B. G., Izvestiya Vysshikh Uchebnykh Zavedeniy -- Matematika, No 4, Apr 72, pp 32-43

$$s_j = s_j^{(N)} = 2j\pi/N,\ j = \overline{1, N},\ N = 1, 2, \ldots, \qquad (5.3')$$

and $\{c_j\}$ and $\{\alpha_j, \beta_j\}$ are unknown coefficients, with $\beta_n = 0$ given N = 2n. These coefficients are determined from the system of linear algebraic equations

$$\sum_{k=1}^{m}\left[a_{kj}x_{nkj} + \frac{b_{kj}}{N}\sum_{l=1}^{N}a_{j-l}^{(N)}x_{nkl} + \frac{1}{N}\sum_{l=1}^{N}h_{kjl}x_{nkl}\right] = f_j \quad (j = \overline{1, N}). \qquad (5.4)$$

System (5.4) is equivalent to the following:

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GABDULKHAYEV, B. G., Izvestiya Vysshikh Uchebnykh Zavedeniy -- Matematika, No 4, Apr 72, pp 32-43

$$A_{j0}\alpha_0 + \sum_{r=1}^{n} A_{jr}\alpha_r + B_{jr}\beta_r = f_j \ (j = \overline{1, N}). \qquad (5.5)$$

Knowing the solution of the system (5.4)-(5.5), it is possible from interpolation formula (5.3) to determine the approximate solution $\varkappa_n(s) = \varkappa_n^{\pm}(s)$ of singular integrodifferential equation (5.1). In addition, from (5.1)-(5.5) given $m = 0$ a computational scheme is obtained for the method of mechanical quadratures for a complete singular integral equation. Given $b_k(s) \equiv 0$, $h_k(s, \sigma) \equiv 0 (k = \overline{0, m})$, there follows from (5.1)-(5.5) one of the computational schemes for the colocation method, also known as interpolation method, for the corresponding ordinary differential equation with periodic coefficients. Therefore, the proposed approximation method for solving

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USSR

GABDULKHAYEV, B. G., Izvestiya Vysshikh Uchebnykh Zavedeniy -- Matematika, No 4, Apr 72, pp 32-43

the singular integrodifferential equation is known as the quadrature-interpolation method, and (5.1)-(5.5) as its computational scheme. The so-called operator scheme is used to substantiate computational scheme (5.1)-(5.5), as well as some modifications thereof.

The author thanks Valentin Konstantinovich IVANOV for his interest in the work.

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USSR

UDC 517.948

GABDULKHAYEV, B. G., Kazan'

"Direct Methods for the Solution of Some Operator Equations, II"

Kazan', Izvestiya Vysshikh Uchebnykh Zavedeniy -- Matematika, No 12, Dec 71, pp 28-38

Abstract: The article, which is a continuation of an earlier work by the author, considers the use of the method of mechanical cubatures, as well as the Galerkin method for some linear and nonlinear, multidimensional, singular integral equations. All (or almost all) of the results can also be applied to singular integral equations with Cauchy-type kernels of a very wide class, as well as to systems of singular integral equations with Hilbert and Cauchy-type kernels. The author thanks Valentin Konstantinovich Ivanov for his interest in the work.

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USSR

UDC: 518

GABDULKHAYEV, B. G., DUSHKOV, P. N., Kazan'

"Concerning Direct Methods of Solving Singular Integral Equations of the First Kind"

Kazan', Izvestiya VUZov: Matematika, No 7(134), Jul 73, pp 12-23

Abstract: A number of problems in mechanics reduce to the singular integral equation

$$L\varphi \equiv \frac{1}{\pi}\int_{-1}^{1}\frac{\varphi(\tau)}{\tau - t}\,d\tau + \frac{1}{\pi}\int_{-1}^{1}h(t,\tau)\varphi(\tau)\,d\tau = f(t); \qquad (1.1)$$

where h (with respect to both arguments) and f are variable functions, and the singular integral is understood in the sense of the principal Cauchy--Lebesgue value. In this paper an approximate solution of equation (1.1) is found by the methods of interpolation. Particular emphasis is placed on substantiating the examined computational schemes on the basis of a modification of the general theory of approximation methods (L. V. Kantorovich). Convergence in the mean is proved for the given methods, and uniform convergence is derived as a consequence. Errors are evaluated.
1/1

USSR UDC: 681.121+551.571:665.61

GABDULLIN, T. G., YERMOSHIN, Yu. A., ZINATULLIN, F. L., MUSINA, R. G.

"A Depth Instrument for Simultaneous Measurement of Flowrate and Moisture Content"

Tr. Tatar. n.-i. i proyekt. in-t neft. prom-sti (Works. Tatar Scientific Research and Planning Institute of the Petroleum Industry), 1971, vyp. 20, pp 318-328 (from RZh-Metrologiya i Izmeritel'naya Tekhnika, No 6, Jun 72, Abstract No 6.32.581)

Translation: It is shown that a combination instrument which provides for simultaneous measurement of discharge rate and moisture content in a water--petroleum mixture separately by strata is needed when determining the point of leakage into a well. A description is given of the device, the principle of action, and the results of laboratory and industrial tests of the combination instrument. The influence of principal factors on measurement results is determined on the basis of the laboratory tests, and a procedure is given for taking these factors into account when making deep measurements. Five illustrations, one table, bibliography of six titles.

1/1

(1)

UDC 632.95

USSR

KHASANOV, A. S., TSAREV, S. G., KAMAY, G. Kh., AZERBAYEV, I. N., GABDULLINA, N. Z.

"Synthesis of New Chloral-Based Organophosphorus Insecticides"

Alma-Ata, Khimiya atsetilena i tekhnol. karbida kal'tsiya--sbornik (Chemistry of Acetylene and Technology of Calcium Carbide--collection of works), "Kazakhstan," 1972, pp 359-361 (from RZh-Khimiya, No 9, May 73, abstract No 9N476 by T. Ya. Ogibina)

Translation: Agricultural insecticides are synthesized -- ethyl α-naphthyl β,β-dichlorovinyl phosphate (I) and ethyl β-naphthyl β,β'-dichlorovinyl phosphate (II). Example. 0.228 mole of Cl_3CCHO diluted by an equal volume of ether is gradually added with agitation and cooling to -10°C to an ether solution of 0.228 mole of diethyl α-naphthyl phosphite. The mixture is kept for 1 hour at ~20°C, the ether is driven off, the residue is distilled twice under vacuum giving compound I with a yield of 68% $C_{14}H_{13}Cl_2O_4P$, boiling point 150-1°/0.12, d_4^{20} 1.3370, $n^{20}D$ 1.5648. In a similar procedure compound II is produced with a yield of 73.3% $C_{14}H_{13}Cl_2O_4P$, boiling point 161-3°/0.1, d_4^{20} 1.3395, $n^{20}D$ 1.5030. Compounds I and II are insoluble in water, and dissolve readily in ether, acetone and other organic solvents.

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(1)

USSR

KHASANOV, A. S., et al., Khimiya atsetilena i tekhnol. karbida kal'tsiya — sbornik, "Kazakhstan," 1972, pp 359-361

The insecticidal and toxic properties of the chemicals were studied as well as their myotic and anticholinesterase effect and their curative action when hypodermically injected in cattle. It is shown that the toxicity of I for warm-blooded animals is 1.5 times less than that of chlorophos, while that of II is two times less, while the larvicidal effect on midge larvae is ten times greater than that of chlorophos. The curative action of I in hypodermic injection of cattle was studied in 1.5 and 3% concentrations. The preparation was used externally in the form of an emulsion with OP-7 in a dose of 200 ml. The animals were treated in March. Compound II in this method of injection is used only in the form of a 3% emulsion with OP-7. Observations showed that I is 100% lethal and II is 98% lethal for ox bot larvae.

2/2

1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--MODIFICATION OF DEHYDRATED POLYVINYL ALCOHOL BY SCHIFF BASES -U-

AUTHOR-(04)-GABDUVALIYEVA, A.K., KIRILENKO, YU.K., VOLF, L.A., MEOS, A.I.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN., SER. B 1970, 12(3), 227-30

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--POLYVINYL ALCOHOL FIBER, SCHIFF BASE, AZO COMPOUND, CHEMICAL STABILITY, ION EXCHANGE, CHEMICAL REACTION MECHANISM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1677 STEP NO--UR/0460/70/012/003/0227/0230

CIRC ACCESSION NO--AP0125298

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125298

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SEVERAL SCHIFF BASES, CONTG. C:C BONDS, WERE PREPD. BY CONDENSATION OF CH SUB2:CHCH SUB2 NH SUB2 WITH BZH OR ITS DERIVS. THE PHYS. PROPERTIES OF THE UNSATD. AZOMETHINES ARE TABULATED. ALLYL SCHIFF BASES ALSO REACTED WITH PARTIALLY DEHYDRATED POLY(VINYL ALC.) (I) FIBERS IN HCONME SUB2. THE MODIFIED I FIBERS EXHIBITED GOOD PHYSICOMECH. PROPERTIES, HIGH CHEM. STABILITY, AND ION EXCHANGE CAPACITY. A PROBABLE REACTION MECHANISM IS PROPOSED.

FACILITY: LENINGRAD. INST. TEKST. LEGK. PROM. IM. KIROVA, LENINGRAD, USSR.

UNCLASSIFIED

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SECTION III

SO: SELECTED AEROSPACE MEDICAL FACILITIES

FCS-99
SEPT 71

biophysics

Name: Institute of Biophysics, Pushchino

Description:

(U) During this quarterly reporting period, 25 new articles were identified from the Institute of Biophysics, Pushchino. On the basis of these articles, it was possible to identify 32 new personalities with the institute. These personalities, the subjects of the articles, and the dates are given below: All-biophysics/physiology

Aliyeva, S. A.	phosphorylation	1971[34]
Apikayeva, G. F.	radiation effect	1970[35]
Aripova, D. F.	radiation effect	1971[36]
Azhipa, Ya. I.	hypoxia	1969[37]
Bregadze, I. F.	radiation effect	1970[illegible]
Busel, Ye. P.	luminescence	1970[38]
Dmitriyeva, T. I.	radiation effect	1970[39]
Dmitriyeva, V. A.	blood plasma	1969[40]
Donareva, O. P.	radiation effect	1970[39]
Dubrov, A. P.	biochemical analysis	1971[41]
Gabelova, N. A.	muscle physiology	1971[42]
Ganassi, Ye. E.	radiation effect	1970[35]
Ivkova, M. N.	serum albumin	1971[43]
Kasatkin, V. S.	phosphorylation	1971[34]
Khokhlova, G. K.	muscle physiology	1971[44]
Kislov, A. N.	salivary gland	1970[45]
Klyagina, V. P.	oligonucleotide	1970[46]
Korol, B. A.	radiation effect	1971[44]
Koshaleva, G. N.	biochemical analysis	1971[41]

GABELOVA, N.A.

UNCLASSIFIED

Kuzmina, S. V.	tissue culture	1972 (47)
Markovich, D. S.	lactate dehydrogenase	1971 (48)
Metlitskaya, I. F.	radiation effect	1971 (44)
Peshkova, L. V.	phosphorylation	1971 (49)
Pronevich, L. A.	antibiotic	1970 (50)
Rodionova, M. A.	mitochondrion	1971 (51)
Shchipakin, V. N.	phosphorylation	1971 (49)
Skobeyev, Ya. M.	radiation/vibration	1970 (52)
Suvorov, V. [illegible]	radiation effect	1970 ([illegible])
Tsvetkov, V. D.	blood plasma	1969 (40)
Martikina, N. V.	lactate dehydrogenase	1971 (48)
Vilenchik, M. M.	radiation effect	1970 (53)
Zamyatnin, A. A.	muscle physiology	1971 (42)

Dubrov and Koshaleva (41) are associated with the Laboratory of Cell Biophysics at the Institute. Reference 52 above is of special interest since it presents an investigation of combined stresses, i.e., radiation and vibration. In addition to the above articles, five of the twenty-five (54-58) were authored by persons already identified with the Institute of Biophysics, Pushchino. Reference 55 associates the authors of the article, L. V. Slozhenkina, V. L. Migushina, and A. M. Kuzin, with the Department of Radiobiology at the Institute.

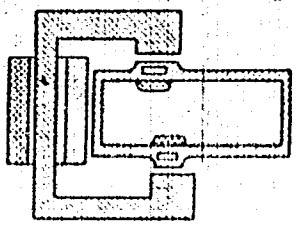
USSR UDC: 621.372.852.22

KRASNOV, Ye. S., GABER, B. N.

"A Nonmutual Phase Shifter"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 31, Nov 71, Author's Certificate No 318104, Division H, filed 21 Aug 69, published 19 Oct 71, p 199

Translation: This Author's Certificate introduces a nonmutual phase shifter which contains a section of rectangular waveguide, two transversely magnetized ferrite inserts located on the wide walls of the waveguide, and a magnetic system. As a distinguishing feature of the patent, the working frequency range is extended and the electrical strength is increased by using ferrite inserts of different thicknesses located at different distances from the narrow walls of the waveguide.



1/1

USSR UDC: 669.15'782'743'295-196

ZHIRONKIN, A. N., BURKANOV, A. G., RAYNES, L. S., BOROVIKOV, A. A., SOKOLOV, V. L., PERSIDSKAYA, L. V., GABERTSETTEL', A. I., TOLOCHIN, V. G., TARAPATIN, P. S., Leningrad Kirov Plant

"Graphitized Steel"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 12, Apr 72, Author's Certificate No 334272, Division C, filed 15 Sep 69, published 30 Mar 72, p 104

Translation: This Author's Certificate introduces a graphitized steel which contains carbon, silicon, manganese, titanium and iron. As a distinguishing feature of the patent, friction properties are improved by adding copper and taking the components in the following proportions in percent: carbon--1.3-1.5; silicon--1.3-1.6; manganese--0.3-0.5; copper--1.2-1.6; titanium--0.25-0.4. Impurities are as follows (in percent): sulfur--less than 0.03; phosphorus--less than 0.035; chromium--0.20; nickel--less than 0.20; the remainder iron.

1/1

GABESKIRIYA, V. Ya.

JPRS 55882

4 May 1972

UDC 621.039.564:621.311.25:621.039

STUDY OF THE BUILDUP OF PLUTONIUM ISOTOPES IN THE FUEL OF THE VVER-1 REACTOR OF THE NOVO-VORONEZHSKIY ATOMIC POWER STATION

[Article by V. Ya. Gabeskiriya, V. S. Belokopytov, G. A. Miller, G. A. Simakin, L. I. Shcherakov, Z. I. Pakhomov, K. A. Vladimirova, and I. V. Matyashchuk, Scientific Research Institute of Atomic Reactors; Voleksa, [illegible] Issledovaniye nakopleniya izotopov plutoniya v toplive Reaktora VVER-1 Novo-Voronezhskoy AES, Russian, Atomizdat, 1970, printing, 220 copies, signed to press January 1970, 16 pp]

Introduction

The isotopic composition of irradiated fuel in samples cut from fuel elements of the VVER-1 reactor of the Novo-Voronezhskiy Atomic Power Station was investigated in order to determine experimentally the isotopic composition of irradiated fuel in a reactor of the VVER type within the framework of contract no. 577/RB with the International Atomic Energy Agency. The tasks of this study were:

(a) determining the uranium and plutonium isotopic composition after irradiation of the fuel;

(b) determining the number of plutonium isotopes formed as a result of irradiation;

(c) determining the isotopic composition of the fuel as a function of the degree of burn-up.

1. Preparation of Samples

The assembly from which the fuel element was taken was irradiated for 2.75 years and held for 1.5 years before the investigation.

[I - USSR - K]

USSR

KARALOVA, Z. K., PALEY, P. N., IVANOV, R. N., GABESKIRIYA, V. YA., and PYZHOVA, Z. I.

"Investigation of Protactinium and Uranium Accumulation by Thermal Neutron Irradiation of Th^{230} and Th^{232}"

Moscow, Akademiya Nauk SSSR, Atomnaya Energiya, Vol 28, No 3, Mar 70, pp 199-201

Abstract: An investigation was made to determine the accumulation of protactinium and uranium isotopes, and the burn-up of thorium isotopes during the irradiation of specimens with an isotope ratio $Th^{230}/Th^{232} = 1.462$ by a 1×10^{15} neutron/cm^2 · sec flux of thermal neutrons. The experimental procedure and technique are described in detail. It is shown that 3.5% of the original Th^{230} was transformed into Pa^{231} by the irradiation of the thorium specimen with a 1.462 isotope ratio for 10 periods of 24 hours each by a 1×10^{15} neutron/cm^2 · sec flux of thermal neutrons. The isotope ratio Th^{232}/Th^{230} increased from 1.464 to 1.557, which is connected to the more rapid burn-up of Th^{230} than of Th^{232}. The effective radiation capture cross sections of Th^{230}, Pa^{231}, and U^{232}, calculated from the experimental data are 78.5± 12, 280, and 170 barns, respectively. The obtained results were used to calculate the Pa^{231} accumulation for a given

USSR

KARALOVA, Z. K. et al, Atomnaya Energiya, Vol 28, No 3, Mar 70, pp 199-201

Th^{230} in suspension as a function of integral neutron flux. The maximum Pa^{231} yield at a 1×10^{15} neutron/cm^2 . sec thermal neutraon flux density after 100 effective periods of 24 hours was about 26%. Orig. art. has: 3 figures, 1 table, and 4 references.

2/2

USSR • UDC 536.46:533.6

GABIDOVSKIY, A. G., GAFAROV, A. S., REPIN, V. B., KHALITOV, N. Kh.

"Area of Existence as a Function of Diameter of Injection Pipe"

Sb. Aspirantsk. Rabot. Kazan. Un-t. Tochn. Nauki. Mekh. Fiz. [Collected Post Graduate Writings of Kazan' University, Precision Mechanics, Mechanical Physics], No 2, 1972, pp 91-94, (Translated from Referativnyy Zhurnal, Mekhanika, No 11, 1972, Abstract No 11 B776 by G. M. Makhviladze).

Translation: An experimental study is performed into the influence of the diameter of an injection pipe on the area of existence of relaxation vibration combustion. The fuel mixture used is city gas and air. The experiments were performed at room temperature and atmospheric pressure. The area of existence of relaxation vibration combustion was determined in the coordinates gas mixture consumption vs. mixture concentration. The boundaries of flame-out and breakthrough are determined for various diameters of injection tubes. The area of existence of relaxation vibration combustion is displaced in the direction of higher consumptions and higher concentrations as the diameter of the injection tube is increased.

1/1

USSR

UDC 51:621.391

[redacted], KORZHIK, V.I.

"Codes For Correction Of Array Configuration Errors"

Izv. VUZ: Radioelektronika, Vol XV, April 1972, pp 492-498

Abstract: A mathematical model is advanced for a system of parallel channels subjected to the effects of fading, selective interference, and short-duration discontinuous interference. Also considered are codes which correct errors the most characteristic of these channels (errors of array configuration). New metrics are introduced, adapted for a description of the error of an array configuration. Asymptotically coincident upper and lower limits are obtained for a minimum code spacing (in the sense of the metric introduced). One class of optimum code is described. 1 fig. 4 ref. Received by editors, 1 October 1971.

USSR UDC: 531.717.55:621.383

GABIDULIN, M. A., KOSINSKIY, A. V., Moscow Institute of Electronic Machine Building

"A Photoelectric Moire Pickup"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 12, Apr 72, Author's Certificate No 334473, Division G, filed 21 Jan 69, published 30 Mar 72, p 157

Translation: This Author's Certificate introduces: 1. A photoelectric Moire pickup which contains an illuminator, movable and stationary rasters, four photocells displaced relative to one another in accordance with the phase of the Moire band by ¼ step, an amplifier with two output channels which unite the photocell signals by pairs, and a readout device. As a distinguishing feature of the patent, measurement accuracy is improved by adding a reference signal generator, a modulator for the luminous flux of the illuminator operating on the reference signal frequency, and a logic module which displaces the phase of the output signal relative to the reference signal in proportion to the displacement of the moving raster. The logic module is made in the form of an RC-circuit tuned to the fre-

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USSR

GABIDULIN, M. A., KOSINSKIY, A. V., USSR Author's Certificate No 334473

quency ω of the reference signal so that RCω-I [sic]. The active (resistive) and capacitive inputs of the RC network are connected to the outputs of the amplifier channels, and the centertap is connected to the readout device.
2. A modification of this pickup distinguished by the fact that errors due to variations in the reference frequency signal, in the parameters of the RC circuit, and to amplifier phase errors are compensated by adding a second RC circuit of reverse polarity, and by using the phase difference between signals taken off from the centertaps of the two RC circuits as the output.

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USSR

UDC: 621.314.25

GABIDULIN, M. A., DRAGONER, V. V., GABIDULINA, G. A., Moscow Institute of Radio Engineering, Electronics and Automation

"A Phase Splitter"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329551, Division G, filed 3 Aug 70, published 9 Feb 72, p 197

Translation: This Author's Certificate introduces a phase splitter which contains a reference oscillator, an integrating amplifier with controllable amplification factor, inverting amplifiers, a comparison circuit and an adder. As a distinguishing feature of the patent, the stability of the amplitudes and phase shifts of the output voltages is improved by connecting the first input of the adder, the input of the first inverting amplifier, the input of the integrating amplifier and the first input of the comparison circuit to the output of the reference oscillator. The first inverting amplifier is connected to the second input of the adder, and the second input of the comparison circuit is connected to the input of the second inverting amplifier, which is connected in turn to the third input of the

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USSR

GABIDULIN, M. A. et al., USSR Author's Certificate No 329551

adder, to the fourth input of the adder, and to the output of the amplifier with controllable amplification factor. One input of this amplifier is connected to the output of the comparison circuit, and the other input is connected to the output of the integrating amplifier.

AA0044540

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

2/70

238245 TRAVEL-TO-PHASE CONVERTER of the photo-electric type has a measuring grating which is connected to the travelling workpiece and moves in front of an optical system with a light source. Two stationary gratings produce sine and cosine characteristics of transparency. These are detected by two photoelectric receivers and passed to analog-to-digital converters and memory registers. A comparator at the output of one system is to establish the arithmetical mean of the max. and min. voltage of the photoelectric elements in series with an amplifier having a variable amplification factor and in parallel with the output of the second system. After modulation an adder produces a voltage, the phase of which is equal to the desired travel.

24.6.67 as 1165983/18-24.M.A. GABIDULIN, MOSCOW ELECTRONIC ENGINEERING INST. (2.7.69) Bul 9/20.2.69

Class 42m5. Int.Cl.G 06f.

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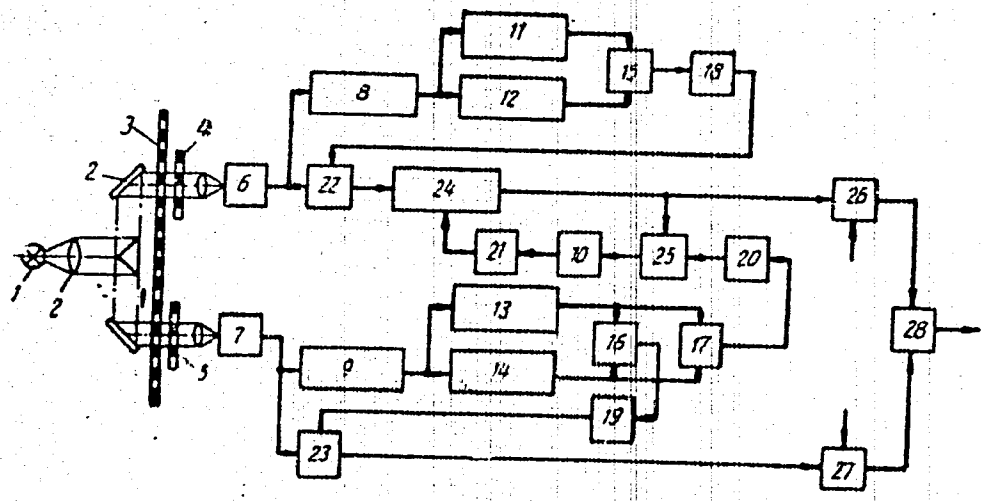

Moskovskiy Institut Elektronnogo Mashinostroyeniya

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19771342

USSR

UDC: 621.314.25

GABIDULIN, M. A., DRAGONER, V. V., GABIDULINA, G. A., Moscow Institute of Radio Engineering, Electronics and Automation

"A Phase Splitter"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329551, Division G, filed 3 Aug 70, published 9 Feb 72, p 197

Translation: This Author's Certificate introduces a phase splitter which contains a reference oscillator, an integrating amplifier with controllable amplification factor, inverting amplifiers, a comparison circuit and an adder. As a distinguishing feature of the patent, the stability of the amplitudes and phase shifts of the output voltages is improved by connecting the first input of the adder, the input of the first inverting amplifier, the input of the integrating amplifier and the first input of the comparison circuit to the output of the reference oscillator. The first inverting amplifier is connected to the second input of the adder, and the second input of the comparison circuit is connected to the input of the second inverting amplifier, which is connected in turn to the third input of the

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GABIDULIN, M. A. et al., USSR Author's Certificate No 329551

adder, to the fourth input of the adder, and to the output of the amplifier with controllable amplification factor. One input of this amplifier is connected to the output of the comparison circuit, and the other input is connected to the output of the integrating amplifier.

USSR

UDC 669.1.13:539.219.3:669.788

GABIDULLIN, R. M., and YAKUSHEV, V. A., Stupinsk Branch of Moscow Aviation Technological Institute, Chair of the Science of Metals and Hot Working of Metals"

"On the Hydrodynamics of the Hydrogen Distribution in Metals"

Ordzhonikidze, Tsvetnaya Metallurgiya, No 2, 1973, pp 40-43

Abstract: The distribution of hydrogen between different phases of the crystal lattice was analyzed, assuming the absence of hydrogen losses through the surface of the specimen. On the basis of Borelius' equation for the volumetric concentration of H in each phase and from derived functions characterizing H pressure in pores after stabilized thermodynamic equilibrium and H masses in the solid solution and in pores, formulas for the distribution coefficient of H and of its average concentration in the solid solution were derived from which the equilibrium concentration of H in metal can be determined. Calculated relative concentrations of H in solid Al and Fe solutions show that in Al, at practically occurring average H concentrations, the larger

USSR

GABIDULLIN, R. M., and YAKUSHEV, V. A., Tsvetnaya Metallurgiya, No 2, 1973, pp 40-43

part of H is found in pores over the entire temperature range of the solid state. An analogous concentration is observed in steel at temperatures below 200°C; however, at rising temperature, most part of H changes into the solid solution. Calculations revealed that the establishment of thermodynamic equilibrium of H between the solid solution and pores takes place over a very short period, not exceeding tens of seconds. Three figures, thirteen formulas, four bibliographic references.

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USSR UDC 669.295.5:788:539.219

KOLACHEV, B. A., NAZIMOV, O. P., and GABIDULLIN, R. M., Moscow Institute of Aviation Technology, Department of Metal Science and Hot Metal Working

"Thermal Diffusion of Hydrogen in Titanium and VT15 Alloy"

IVUZ, Tsvetnaya Metallurgiya, No 2, 1971, pp 99-103

Abstract: Experiments are described which confirm the phenomenon of thermal diffusion of hydrogen in titanium alloys. The thermal diffusion of hydrogen was studied in technical titanium containing 0.045% Si, 0.011% O_2, 0.06% N_2, and 0.012% C, and in β titanium VT15 alloy containing 3.7% Al, 10.6% Cr, 7.35% Mo, 0.03% C, 0.11% Fe, 0.04% Si, and 0.011% O_2. The studies were perfcrmed on forged material produced from an ingot made in an arc furnace with a consumable electrode. The data indicated that thermal diffusion of hydrogen actually can result in concentrations in the cold areas of the specimen sufficient to cause hydrogen brittleness. As the temperatures at which thermal diffusion is

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USSR

KOLACHEV, B. A., et al., Tsvetnaya Metallurgiya, No 2, 1971, pp 99-103

studied are increased, hydrogen brittleness does not develop, but if parts of these alloys are cooled to low temperatures after operating at high temperatures, brittleness becomes possible once again.

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USSR

UDC 669.788

GABIDYLLIN, R. M. and YAKUSHEV, V. A., Moscow Aviation Technology Institute

"Distribution of Hydrogen in Iron"

Moscow, Izvestiya VUZ, Chernaya Metallurgiya, No 9, 1973, pp 54-57

Abstract: The authors find equations which allow them to compute the amount of hydrogen in a solid solution and in the pores as a function of the mean concentration of hydrogen, porosity of the metal, and the temperature. At temperatures greater than 200 degrees C the greater part of the hydrogen is found in the solid solution, and at low temperatures it moves into the pores. The authors have computed the equilibrium pressures of the hydrogen in the pores. The article contains 2 illustrations and 2 bibliographic references.

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USSR

GABINSONIYA, V. Ye.

UDC: 519.2

"Adaptive Bayes Approach to the Problem of Determining Parameters of *a Posteriori* Distributions"

Tr. In-t sistem upr. AN GruzSSR (Works of the Institute of Control Systems, Academy of Sciences of the Georgian SSR), 1971, 10, No 1, pp 49-56 (from RZh-Kibernetika, No 4, Apr 72, Abstract No 4V148)

[no abstract]

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1/2 020 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--NEW EPOXY POLYAMIDE PRIME COATS AND ENAMELS -U-

AUTHOR-(04)-CHEBOTARVESKIY, V.V., YESELEV, A.D., SMIRNOVA, L.I., GABIROV, I.Z.

COUNTRY OF INFO--USSR

SOURCE--LAKOKRASOCH. MATER. IKH. PRIMEN. 1970, (1), 22-5

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--ENAMEL, PROTECTIVE COATING, EPOXY RESIN, PAINT, GASOLINE, KEROSINE, FERTILIZER, THERMAL STABILITY, CHEMICAL STABILITY/(U)EP076 PRIMER, (U)EP140 ENAMEL, (U)EP076T PAINT, (U)PO200 PAINT RESIN, (U)EP09T COATING, (U)A63A PRIMER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/0554 STEP NO--UR/0303/70/000/001/0022/0025

CIRC ACCESSION NO--AP0107159

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0107159

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FORMULATIONS WERE DEVELOPED FOR EPOXY RESIN POLYAMIDE EP-076 PRIMER (I) AND EP-140 ENAMEL (II). I WAS COMPOSED OF EP-076T PAINT AND HARDENER NO. 2 (III) (A 30PERCENT P0-200 RESIN SOLN.) WHICH WERE BLENDED IN 75:25 RATIO JUST PRIOR TO APPLICATION; II WAS ALSO COMPOSED OF A PAINT AND III, AND WAS AVAILABLE IN A VARIETY OF COLORS. THE 2 COATINGS HAD SIMILAR PHYSICOMECH. PROPERTIES, BUT I (DUE TO THE SPECIFIC STRUCTURE OF POLYAMIDES) WAS INTERNALLY PLASTICIZED, WHICH MARKEDLY IMPROVED ITS THERMAL STABILITY AND AGING RESISTANCE. A 4 YEAR STUDY OF II APPLIED OVER AN AG-3A PRIMER SUGGESTED THAT THE FORMER EXHIBITED GOOD WEATHERABILITY AND RESISTANCE TO GASOLINE, KEROSINE, NH SUB4 OH, AND VARIOUS DETERGENTS. II CAN BE EFFECTIVELY USED AS A PROTECTIVE COATING IN PLANTS MANUFG. N FERTILIZERS. I COATINGS WERE MARKEDLY MORE PROCESSABLE THAN EP-09T COATING AND HAD SUPERIOR HARDNESS, THERMAL STABILITY, AND OIL RESISTANCE.

UNCLASSIFIED

USSR

UDC 51.155.001.57.681.3.06

GABISONIYA, V. Ya.

"Information Content of Signs"

Tr. In-ta. Elektron., Avtomatikiki i Telemekh. AN Gruz SSR [Works of Institute of Electronics, Automation and Telemechanics, Academy of Sciences, Georgian SSR], 8, No. 1, 1970, pp 182-198 (Translated from Referativnyy Zhurnal Kibernetika, No. 4, April, 1971, Abstract No. 4 V704 by A. Krasilov).

Translation: A method of representing speech signals in plane (t,ω) is studied. A formula is concluded for the quantity of information in each representation of the signals, and the formula is studied in specific form for the normal distribution of probabilities of observations. The task of optimal determination of the information characteristics is stated.

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USSR

UDC: 62-52

GABISONIYA, V. Ye.

"Training System of Random Signal Recognition"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, No 1, 1973, pp 33-36

Abstract: It is assumed that in n operating cycles of a training system, input test signals Z(t) and instructor's signals $W_1,\ldots,W_n$ are obtained. The system then obtains the next input signal in the n+1 cycle. The problem is to find a method of processing the whole system of information in which the mathematical expectation of the loss function is minimized by the solution in the n+1 cycle. If Σ is the sum of all of the observed test signals Z(t), the $\tilde{W}$ signals put out by the instructor, and the test signal $Z_{n+1}(t)$, the probability of the averaged loss function in two receptions is

$$R(\delta) = M\left[M\left[\underline{1}(W,\chi)\right]\right] = M\left[R(\delta,\Sigma)\right].$$

The desired solution, χ, must be the result of applying an operator A to $Z_{n+1}(t)$, where A is a function of the preceding signals:

$$\chi = A(Z_1\tilde{W}_1,\ldots,Z_n,\tilde{W}_n)Z_{n+1}.$$

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USSR

GABISONIYA, V. Ye.

"A Learning System for Recognition of Random Signals"

Soobshch. AN GruzSSR [Reports of Academy of Sciences, Georgian SSR], 1973, Vol 69, No 1, pp 33-36 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V234, by the author).

Translation: The problem of classification of random signals is studied by methods of the theory of statistical decisions, using canonical expansions to determine the conditional probability density.

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USSR

GABOVICH, A. M., PASHITSKIY, E. A. (Physics Institute of the Ukrainian Academy of Sciences, Kiev)

"Magnetic Susceptibility of a Degenerate Electron Gas. Interaction of Nuclear Magnetic Moments in Normal Metals and Superconductors"

Kiev, Ukrainskiy Fizicheskiy Zhurnal, June 1973, pp 898-905

Abstract: Static magnetic susceptibilities of normal and superconducting electron gases were calculated by means of a macroscopic electrodynamic approach based on the Lindhard formula (Dan. Mat. Fys. Medd., 28, 8, 1954) relating magnetic permeability with transverse and longitudinal dielectric constants of a medium having space and time dispersion. A formula is obtained for the energy of the interaction of nuclear magnetic moments in normal metals. It is shown that the logarithmic singularity at the point $q = 2k_F$, characteristic of the magnetic susceptibility of a degenerate electron gas, disappears in the transition from a normal to a superconducting state; this may affect the character of ordering nuclear spins in superconductors as well as the magnitude of the anomalies in the spin wave spectrum under the condition of the simultaneous existence of ferromagnetism and superconductivity.

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USSR

GABOVICH, A. M., PASHITSKIY, E. A. (Institute of Physics of the Ukrainian Academy of Sciences, Kiev)

"Polarization Operator of a Superconducting Electron Gas. Kohn Anomalies and Screening of the Charge in Superconductors"

Kiev, Ukrainskiy Fizicheskiy Zhurnal, April 1973, pp 549-557

Abstract: A static polarization operator of superconducting electron gas $\Pi_3(q,0)$ was calculated within the framework of the Bardeen-Cooper-Schrieffer model at $T = 0$. It is shown that, as a result of the Fermi surface diffusion by an amount on the order of Δ (where Δ is a gap in the spectrum of quasi particles), the logarithmic singularity at the point $q = 2k_F$ in $\Pi_3(q,0)$ characteristic of the polarization operator for a normal electron gas $\Pi_n(q,0)$ is absent. This leads to a diffusion of the Kohn anomalies in the metal phonon spectrum and to a change in the character of the asymptotic behavior of the screened potential of the charge at distances of $r \geqslant \xi_0$ (ξ is the coherence length).

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UDC: 621.791.72

USSR

PATON, B. YE. and NAZARENKO, O. K., Institute of Electric Welding imeni Y. O. Paton Academy of Sciences Ukrainian SSR, and GABOVICH, M. D. and SOLOSHENKO, I. A., Institute of Physics, Academy of Sciences Ukrainian SSR

"Particulars and Principles of Conducting Ion-Beam Welding"

Kiev, Avtomaticheskaya Svarka, No 10, Oct 73, pp 1-4

Abstract: The authors show the necessity to neutralize ion beams in order to achieve their high specific power. Neutralization methods are studied. The attainable specific power is calculated and experimentally verified. The ion welding beam is described and the possibility of its practical application indicated. The results of the study show that it is possible to weld with an axially-symmetric, electron compensated, helium ion beam with specific power in excess of 10^4 w/cm^2. The following attest to the prospective use of ion-electron beam welding: absence of x-ray radiation, low sensitivity to the effect of external magnetic fields, the possibility of welding products without electrical contact with the charged particle source, and welding dielectric.

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UDC 539.188

USSR

GABOVICH, M. D., KUZNETSOV, V. S., SOLOSHENKO, I. A., TRUBNIKOV, G. I., Scientific Research Institute of Electrophysical Equipment imeni D. V. Yefremov, Leningrad; Institute of Physics, Ukrainian SSR Academy of Sciences, Kiev

"Investigation of Neutralization of an Intense Ion Beam by a Numerical Method"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 43, No 10, Oct 73, pp 2178-2181

Abstract: Numerical solution of a system of equations of a self-consistent field is used to study neutralization of the space charge of an ion beam by introducing electrodes. The changes in configurations of transverse phase volumes of the electron and ion components lengthwise of the beam are considered. The values found for the radial potential differential in a neutralized beam are compared with the results of approximate calculation. The experimentally observed increase of electron temperature in the beam is confirmed and explained.

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USSR

UDC 533.916

GABOVICH, M. D., PROTSENKO, I. M., and PORITSKIY, V. Ya.

"Double-Flow Instability of Interwoven Ion Beams Moving in a Single Direction Along an External Magnetic Field"

Kiev, Ukrainskiy Fizicheskiy Zhurnal, No 2, 1973, pp 308-310

Abstract: In an earlier paper published by the authors named above (Gabovich, M. D., et al, Doklady 8-y Mezhdunarodnoy koferentsii po yavleniyam v ionizovannykh gazakh, Vena -- Reports of the Eighth International Conference on Phenomena in Ionized Gases, Vienna -- 1967, p 366) the possibility of exciting oscillations in ion beams moving along a magnetic field with differing velocities was demonstrated; because the equipment used operated in the pulse mode, however, the spectra of the oscillations could not be observed. The present paper remedies this deficiency by describing experiments performed with equipment operating in the steady-state mode. A sketch of the equipment, containing two sources of helium ions in a current of the order of 5 ma and energies of up to 10 kev at either end of an evacuated chamber 70 cm long and 14 cm in diameter, is given. The spectra of the oscillations as functions of the difference between the beam energies are shown together with a curve

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GABOVICH, M. D., et al, Ukrainskiy Fizicheskiy Zhurnal, No 2, 1973, pp 308-310

showing the dependence of the oscillation amplitude on the difference in beam energies. The facts uncovered by the experiments are found to be in agreement with the theory.

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